DOCUMENT RESUME

ED 248 439 CG 017 713

AUTHOR Boudreau, John W.
TITLE Utility Analysis Models for Productivity Improvement Programs Affecting Work Group Composition.
PUB DATE Aug 84
NOTE 21p.; Paper presented at the Annual Convention of the American Psychological Association (92nd, Toronto, Canada, August 24-28, 1984).
PUB TYPE Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Decision Making; Employees; *Group Dynamics; Labor Force; *Labor Force Development; *Labor Turnover; *Productivity; Work Environment
IDENTIFIERS *Utility Analysis

ABSTRACT

Utility analysis offers human resource management a powerful framework for decision making. Previous research has indicated that this framework can provide dollar-valued estimates of the consequences of human resource decisions. Moreover, this framework provides a general model of decision costs and benefits that can help organize and integrate human resource management decisions and research. Utility analysis can be applied to a broad family of employee movement phenomena, including recruitment, selection, internal movement, and outward movement. Such applications compare the quantity and quality of employee movements to the cost incurred to accommodate those movements. What is needed is future research proceeding from this decision-theoretic perspective. Where utility models are developed (primarily for inward and outward movement), applications are needed that demonstrate the models and suggest refinements to make the models more realistic and generalizable. Where utility models are just emerging (primarily in internal movement), further conceptual development, followed by empirical research to apply and improve the basic models, is needed. This research is also likely to have practical applications, enabling human resource managers to more readily integrate their decisions and analyses with those of other management functions. (BL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED248439

Utility Analysis Models for Productivity Improvement Programs Affecting Work Group Composition

John W. Boudreau

New York State School of Industrial and Labor Relations

Cornell University

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

John N. Boudreau

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

UTILITY OF PROGRAMS AFFECTING WORK GROUP COMPOSITION

Paper presented at the American Psychological Association's 92nd Meeting, Toronto, August, 1984.

CG 017713

Utility analysis models for human resource productivity improvement programs were originally formulated for applications to employee selection procedures (Cronbach & Gleser, 1965). Selection activities affect work group productivity by altering the composition of the work group's membership. Applications to computer programmers (Schmidt, Hunter, McKenzie, & Muldrow, 1979), salespersons (Cascio & Silbey, 1979), and steelworkers (Arnold, Rauschenberger, Soubel & Guion, 1982) have indicated that improved selection can have substantial dollar-value payoff for organizations.

Subsequent utility model development has turned to applications involving human resource programs ("treatments") which improve productivity not by changing the composition of the workforce membership, but by changing the characteristics of the members themselves. Schmidt, Hunter, & Pearlman (1982) described applications to training. Landy, Farr, & Jacobs (1982) described applications to performance feedback. Hunter & Schmidt (1983) recently noted that meta-analytic reviews (e.g.,Locke, Feren, McCaleb, Shaw, & Denny, 1980) can provide effect sizes in terms of percentage output improvement for many characteristic-changing programs (e.g., incentive pay, goal setting, job enrichment, participative management).

While both types of utility models are important, an obvious gap in existing literature involves utility models for human resource programs and phenomena (<u>other</u> than external selection)

that affect productivity by changing the workforce membership. Changes in workforce membership occur when the workforce is altered by adding new individuals, removing individuals, or rearranging individuals among jobs or units. I will use the term "employee movement" to describe these individual-specific changes in the employment agreement (e.g., selection, transfer, demotion, layoff).

Employee movement represents a family of options to address human resource management goals or problems (e.g., high costs, low productivity, excessive or inadequate workforce size, etc.) as well as a family of consequences that may result from human resource management decisions. Previous human resource management research, however, has often addressed each employee movement type in isolation. Little attempt has been made to identify common movement decision parameters, and little research has linked findings about one movement type (e.g., employee selection) with findings about another (e.g., employee turnover). For utility models to attain a more prominent place in applications of human resource management and industrial psychology, they must provide an integrative approach to management decisions that better reflects the interrelationships between human resource programs and their consequences.

This paper describes how utility analysis offers an integrative conceptual framework for employee movement decisions. First, I establish concept definitions. Then, I discuss each of four movement processes, pointing out how recent utility analysis

models suggest similarities, distinctions, and integration between them. This framework suggests a new research perspective that is more compatible with applied human resource decisions.

Definitions

Employee Movement

Employee movement is the establishment alteration, or termination of the employment contract between an individual and an organization. Movement into and out of organizations involves initiating and terminating employment contracts. These movement types are termed external movement because they involve movement to or from sources external to the payroll boundary. In contrast, internal employee movement is employee movement within the employment (or payroll) boundary of the organization. Such movement takes place between hierarchical or functional locations.

My discussion focuses on four human resource management functional processes. The four processes (in their usual chronological order) are: 1) recruitment, activities or decisions that alter the characteristics of applicants to whom selection procedures are ultimately applied; 2) selection, activities or decisions that evaluate predictor information on a pool of applicants for the purpose of determining which one(s) will be offered employment contracts; 3) internal movement, activities or decisions that affect changes in employment contracts to alter the hierarchical or functional position of the individual in the organization; and 4) outward movement, activities or decisions that

affect termination of employment contracts.

The Parameters of Employee Movement Utility Models

Movement utility models focus on three decision consequences: 1) the quantity of movers, 2) the quality of movers, and 3) the costs incurred to produce the movement. While the algebraic form of the utility models is sometimes complex, these models all share a concern with these three basic issues. This similarity suggests that utility models can provide a way of thinking about employee movement that allows the four processes to be considered within a common framework.

For brevity and simplicity, I will not present algebraic formulas for the utility models discussed. However, I will use concepts from algebraically-derived utility models because those concepts and their relationships are the most precisely defined. I will discuss selection utility first, because its utility models have received the most attention. Then, I will show how the concepts embodied in that model offer an integrative conceptual framework for future research and practical decisions.

Selection Utility

Selection involves establishing an employment contract. Thus, it requires generating an external applicant pool and selecting a subset of that pool to become organizational members. Utility analysis research has emphasized evaluating selection programs. The Cronbach and Gleser (1965) selection utility model has received a great deal of attention and modification in recent research.

This model and its recent modifications suggest at least six utility parameters that could be affected by selection decisions: 1) the number of employees acquired, 2) the validity of selection devices used to choose which applicants will receive job offers; 3) the average standardized predictor of those selected; 4) the value of a one-standard deviation difference in the service value (the dollar value of goods and services produced through employment) among applicants; 5) the proportion of service value increases that are paid back to employees to maintain and improve their services (service costs), such as incentive pay; and 6) the costs incurred to select and hire the applicants.

In terms of the three general utility variables identified above, parameter 1 reflects the quantity of movers, the product of parameters 2, 3, 4, and 5 reflect the average quality of selected employees, and parameter 6 reflects the costs of selection.

Boudreau (1983b) developed a utility model incorporating the flow of employees into and out of the workforce. He noted that productivity improvement programs could be applied repeatedly over future time periods and that such programs could affect not only the pattern of inflows but the pattern of outflows as well. This model has two implications. First, it suggests that the six utility parameters indicated above may be time-period specific (e.g., the number acquired may vary over future time periods). Second, it suggests that selection may affect not only the quantity and quality of inward movers, but outward movers as well. Outward

movement utility is discussed in detail subsequently.

The selection utility model has been applied repeatedly. Most research has used the model to determine the dollar value of improved (more valid) selection devices (e.g., Arnold, et al. 1983; Boudreau, 1983b; Cascio & Silbey, 1979; Schmidt, et al., 1979). Such research seems to indicate that improved selection can have substantial dollar-valued benefits for organizations. Thus, of the six parameters noted above, parameters two and six have received the most attention. This can be appropriate when addressing only decisions between two or more selection devices applied to the same applicant pool, because the other parameters may often be treated as fixed. However, applying utility analysis to the other movement processes requires recognizing effects on the other four parameters as well as additional ones. The basic utility framework is useful, but it requires modification to encompass a broader set of decisions and consequences, as discussed next.

Recruitment Utility

Recruitment involves activities and decisions that alter characteristics of applicants to whom selection procedures are ultimately applied. In contrast to selection, where the applicant pool has usually been assumed to be fixed, recruitment utility analysis must be concerned with how decisions affect that applicant pool. Because those eventually selected must come from the applicant pool, recruitment utility obviously has important staffing implications.

Boudreau & Rynes (1984) developed a recruitment utility model integrating recruitment and selection utility. They showed that recruitment programs substantially affect staffing utility by determining the characteristics of applicants in the applicant pool considered for selection. For example, an organization might choose to recruit for entry-level management positions by interviewing only MBAs from the top ten business schools, or it might recruit through newspaper advertisements. The applicant pools resulting from the two recruitment strategies are likely to differ.

This has three implications for utility analysis. First, it suggests that recruitment strategies may affect the selection parameters noted above (especially parameters 2 through 6). Second, it suggests that a seventh utility parameter, recruitment costs, must be included in decision analyses (e.g., it may be more costly to recruit nationally than locally due to reduced travel and communication expenses).

Third, the recruitment utility model suggests that recruitment decisions can affect the average level of applicant quality (this average level of quality is the level that would be obtained if no systematic selection were used and employees from a particular applicant pool were chosen randomly). The average level of applicant quality consists of the difference between two components: 1) the average level of service value (the dollar value of expected goods and services produced) among applicants, and 2)

the average level of service costs (costs incurred to retain and support employee services, such as compensation) among applicants. For example, one recruitment approach may generate an applicant population with higher average qualifications than another recruitment approach. Thus, even if selection devices are equally valid in both populations, more qualified selectees will be obtained if the higher-qualified applicant pool is used. (Of course, higher qualifications alone do not imply high utility for recruitment options. Utility depends on both quantity and costs as well as qualifications.)

Recruitment Program Attributes

Boudreau & Rynes (1984) identified four recruitment attributes that might influence recruitment utility: 1) the recruitment method (e.g., newspaper advertising, private employment services, etc.); 2) the recruitment message (e.g., what is communicated about starting salary, job duties, career opportunities, whether realistic previews are provided, etc.); 3) The type and level of required applicant qualifications/job specifications; and 4) administrative procedures (e.g., timing of activities, type of follow up activities, etc.).

They reviewed existing recruitment literature to identify existing research addressing the effects of these four recruitment attributes on the utility parameters listed above. In most cases, research was limited or non-existent. Thus, existing research provides little guidance for applying utility analysis models to

recruitment decisions, or to account for different recruitment strategies when considering selection utility. Yet, recruitment utility can have important implications. Boudreau & Rynes provided simulation data indicating that under realistic assumptions recruitment decisions can substantially affect staffing utility, even to the point of changing decisions that would have resulted from using the traditional selection utility model without considering recruitment.

The recruitment utility model provides a framework for human resource management decisions that recognizes the reality that selection decisions and recruitment decisions are interrelated. Such a framework may help guide future recruitment and selection research in more integrative directions, making future research more relevant and thus more applicable to managerial decisions.

Outward Movement Utility

Outward movement involves terminating the employment contract. The utility of outward movement decisions arises from the quantity and quality of outward movers and the costs incurred to accommodate or process such moves.

Historically, most outward movement research focused on individual correlates or causes of voluntary turnover (e.g., Mobley, Griffeth, Hand, & Meglino, 1979). This research has often made the implicit or explicit assumption that turnover is an organizational problem which should be reduced (Staw, 1980, p. p. 254). Authors have suggested that turnover might be less

dysfunctional (or perhaps even functional) than had previously been assumed (Dalton & Todor, 1979; Jeswald, 1974; Mobley, 1982a, 1982b; Price, 1977; Staw, 1980). While this research has been useful in directing our attention to some of the potential costs and benefits of turnover, no systematic model of turnover utility has been presented.

Boudreau and Berger (1984) proposed an external movement utility model that reflects the combined effects of the quantity and quality of acquisitions (inward movement) and the quantity and quality of retentions over time. Their utility model applies to a family of external movement situations, including pure growth (i.e., only acquisitions occur with no separations), pure reduction (i.e., only separations occur with no acquisitions), steady state with turnover (i.e., workforce size is maintained because the number of acquisitions is equal to the number of separations), as well as to other combinations of acquisitions and separations.

Boudreau & Berger (1984) proposed that utility analysis for employee separations should focus on the number and quality of employees retained, rather than on the number and quality of employees separating. This focus is taken because it is the retained workforce that will determine future utility for the organization. This section focuses on outward movement, and thus on the components of the Boudreau and Berger (1984) utility model applicable to separations/retentions.

Applications and Research Directions

A number of human resource management decisions might affect outward movement utility. For example, management decisions could affect the number separated/retained either positively (e.g., through layoffs or early retirement inducements) or negatively (e.g., through job redesign to raise satisfaction); the average level of service costs either positively (e.g., through an across-the-board pay raise) or negatively (e.g., through an across-the-board pay cut), or the transaction costs of separations either positively (e.g., by instituting exit interviews, severance pay, or assistance in finding new jobs), or negatively (e.g., by removing or reducing exit interviews, severance pay, or assistance in finding new jobs); the performance difference between those retained and the pre-separation workforce either positively (e.g., through merit-based layoffs) or negatively (e.g., through noncompetitive rewards to high performers). Research is needed that examines these programs from a decision-theoretic perspective. Utility analysis models provide such a perspective by pointing out important decision parameters, such as the number of employees affected, the variability in performance, and the effect size of the program on future performance of those retained.

It is also important to note that the Boudreau & Berger (1984) utility model specifically integrates separation/retention utility with acquisition/selection utility. This provides a framework for analyzing and evaluating decisions in terms of the consequences of

both phenomena. For example, better selection may produce better qualified employees who can command more competing job offers due to their high skills. This may mean that one consequence of improved selection is increased turnover. Utility analysis provides a systematic way to consider such consequences. In a simulation, Boudreau & Berger showed that the effects of separation/retention decisions can substantially affect selection utility, and vice versa.

Finally, it is important to note that the separation utility model is based on a similar framework to the recruitment utility model. Thus, the three models combine to provide a utility research framework relevant to decisions affecting all three areas. Such research is more complex than traditional approaches addressing each phenomenon in isolation, but managerial applications demand that such possibilities be addressed. For example, the increased skills generated by improved selection might be enhanced by improved recruitment, but this might also lead to increased turnover. Utility models can offer a step in developing an organized framework for future research that truly takes an integrative, decision-centered approach.

Internal Movement Utility

Internal movement involves decisions and activities that alter the employment contract to change the hierarchical and/or functional position of employees within the organization (e.g., promotions, demotions, transfers). Such movements are

characterized by changes in job duties, responsibility, status, reporting relationships, authority, location, etc.

From a decision-theoretic standpoint, the most important feature of internal movement relative to selection, recruitment, and outward movement is that internal movement affects two organizational units: the unit that receives the internal movers and the unit that sends the internal movers. Thus, internal movement utility analysis must recognize the organizational consequences for both units. Internal movement involves outward movement from the sending organizational unit and inward movement into the receiving organizational unit. Thus, it seems logical that internal movement utility models be developed by drawing on the utility models for inward and outward employee movement discussed above.

An internal movement utility model does not presently exist (although research is under way to develop such a model). Still, it is possible to draw on the observations made earlier regarding inward and outward employee movement to specify some likely research directions implied by linking internal movement with the utility models developed for inward and outward movement.

Internal Movement Utility for the Receiving Organizational Unit

For the receiving unit, the basic utility concepts of selection apply, but the source of acquisitions for internal movement is a specific sending organizational unit, whereas for selection, the source of acquisitions was a particular applicant

pool generated by a particular recruitment program. Just as applicant utility characteristics differ depending on the recruitment program used, so the utility characteristics of candidates for internal acquisitions may differ depending on the sending unit(s) used as the source of internal acquisitions. Unlike inward movement, however, internal movement decisions must also consider the utility implications for the sending unit(s) that lose the internal movers.

Internal Movement Utility for the Sending Organizational Unit

For the sending organizational unit, the consequences of internal separations are similar to those of outward movements. The difference, of course, is that the organizational consequences of the internal acquisitions in the receiving organizational unit should be considered in the decision. With outward movements, such consequences are not considered because the organization no longer receives the benefits and costs of the employees who leave.

Applications and Needed Future Research

Existing internal movement research has not adopted a decision-theoretic approach. Published studies usually focus either on internal movement quantity or rates (e.g., Anderson, Milkovich, and Tsui, 1981; Vroom and MacCrimmon, 1968; Heneman & Sandver, 1977), or on the individual and organizational factors associated with employee satisfaction or performance in the jobs they move into (e.g., Hall, 1976). While such research is useful, it is limited. Focusing only on the quantity or pattern of

internal movements ignores the cost and performance consequences of different inward movement decisions (similar to turnover research focusing only on turnover rates or quantity). Focusing only on employee performance in receiving jobs ignores the utility consequences occurring in the sending jobs.

Future research is needed along two lines. First, we need conceptual contributions that link internal movement decision consequences to the existing and emerging utility models for recruitment, selection, and separations/retentions. Second, we need research exploring how managerial decisions affect internal movement and the internal movement utility parameters identified above. Moreover, by using the utility analysis frameworks developed for selection, recruitment and separations/retentions, future research can capitalize on the similarities between these employee movement phenomena. This integration offers opportunities to develop internal movement utility research that integrates with research in the other areas.

Conclusion

Utility analysis offers human resource management a powerful framework for decision making. Previous research has indicated that this framework can provide dollar-valued estimates of the consequences of human resource decisions. Moreover, even when exact dollar values are not estimated, this framework provides a general model of decision costs and benefits that can help organize and integrate human resource management decisions and research.

Indeed, it is possible that utility analysis will find its greatest value as a decision aid, rather than as a method of evaluating past programs.

Utility analysis can be applied to a broad family of employee movement phenomena. Such applications compare the quantity and quality of employee movements to the costs incurred to accommodate those movements. This general concept is quite powerful in organizing existing utility and employee movement research, and it is equally powerful in suggesting additional research directions.

What is needed now is future research proceeding from this decision-theoretic perspective. Where utility models are developed (primarily for inward and outward movement), applications are needed that demonstrate the models and suggest refinements to make the models more realistic and generalizable. Where utility models are just emerging (primarily in internal movement), we need further conceptual development followed by empirical research to apply and improve the basic models.

Because human resource utility models are founded in similar principles to decision models underlying other management functions, this research is also likely to have practical applications, enabling human resource managers to more readily integrate their decisions and analyses with those of other management functions.

References

Arnold, J. D., Rauschenberger, J. M., Soubel, W., & Guion, R. M. Validation and utility of a strength test for selecting steel workers. Journal of Applied Psychology, 67, 588-604.

Anderson, J. C., Milkovich, G. T., & Tsui, A. (1981) A model of intra-organizational mobility. Academy of Management Review, 6, 529-538.

Boudreau, J. W. (1983) Effects of employee flows on utility analysis of human resource productivity improvement programs. Journal of Applied Psychology, 68, 396-407.

Boudreau J. W. & Berger, C. J. (1984) Decision-theoretic utility analysis applied to employee separations and acquisitions. Manuscript submitted for publication.

Boudreau J. W. & Rynes, S. L. (1984) The role of recruitment in staffing utility analysis. Manuscript submitted for publication.

Cascio,W. F. & Silbey, V. (1979) Utility of the assessment center as a selection device. Journal of Applied Psychology, 64, 107-118.

Cronbach, L. J. & Gleser, G. (1965) Psychological tests and personnel decisions (2nd ed.), Urbana,IL: University of Illinois Press.

Dalton, D. R. & Todor,W. D. (1979) Turnover turned over: An expanded and positive perspective, Academy of Management Review, 4, 225-235.

Hall, D. T. (1976) Careers in organizations, Santa Monica, CA: Goodyear.

Heneman, H. G., III & Sandver, M. G. (1977) Markov analysis in human resource administration. Academy of Management Review, 2, 535-542.

Hunter, J. E. & Schmidt, F. L. (1983) quantifying the effects of psychological interventions on employee job performance and workforce productivity. American Psychologist, 38, 473-478.

Jeswald, T. A. (1974) Cost of turnover and absenteeism in a large organization. In W. C. Hamner & F. L. Schmidt (Eds.), Contemporary problems in personnel. Chicago: St. Clair Press.

Landy, F. J., Farr, J. L., & Jacobs, R. R. (1982) Utility concepts in performance measurement. Organizational Behavior and Human Performance, 30, 15-40.

Locke, E. A., Faren, D. B., McCaleb, V. M. Shaw, K. N. & Denny, A. T. (1980) The relative effectiveness of four methods of motivating employee performance. In K. Duncan, M. Gruneberg, & D. Wallis (Eds.), Changes in working life. New York: Wiley.

Mobley, W. H. (1982a) Employee turnover: Causes, consequences and control. Reading, MA: Addison-Wesley.

Mobley, W. H. (1982b) Some unanswered questions in turnover and withdrawal research,. Academy of Management Review, 7, 111-116.

Mobley, W. H. Griffeth, R. W., Hand, H. H., & Meglino, B. M. (1979) A review and conceptual analysis of the employee turnover process, Psychological Bulletin, 86, 493-522.

Porter, L. W. & Steers, R. M. (1973) Organizational, work, and personal factors in employee turnover and absenteeism. Psychological Bulletin, 80, 151-176.

Price, J. L. (1977) The study of turnover, Ames: Iowa State University Press.

Schmidt, F. L., Hunter, J. E., & Pearlman, K. (1982) Assessing the economic impact of personnel programs on work-force productivity. Personnel Psychology, 35, 333-347.

Schmidt, F. L., Hunter, J. E., McKenzie, R. C. & Muldrow, T. W. (1979) Impact of valid selection procedures on work-force productivity. Journal of Applied Psychology, 64, 609-626.

Staw, B. M. (1980) The consequences of turnover. Journal of Occupational Behaviour, 1, 253-273.

Vroom, V. H. & MacCrimmon, K. R. (1968) Towards a stochastic model of management careers. Administrative Science Quarterly, June, 26-46.